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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,405	12/11/2003	Haochuan Jiang	GEMS8081.200	1404

27061 7590 08/04/2005

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EXAMINER
SONG, HOON K

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/707,405	JIANG ET AL.	
	Examiner	Art Unit	
	Hoon Song	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29 and 31-33* is/are rejected.

7)☒ Claim(s) *30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/24/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 24-25 and 27 are objected to because of the following informalities:

In claim 24 at line 1-2, "the step of pixelating" lacks proper antecedent basis.

In claim 25 at line 3-4, "a plurality of scintillators" should read --the plurality of scintillators--

In claim 27 at line 1-2, "the step of depositing" lacks proper antecedent basis.

There are repeating informalities exist through out the claims. Appropriate correction for all claims is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 7-9, 11, 13-18 and 21-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Mliner et al. (US 6898265B1).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in

the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 1, Mliner teaches a CT detector comprising:

a scintillator array (60) having a plurality of scintillators' (50) and

a reflector interstitially disposed between at least two adjacent scintillators (50), the reflector including a light absorption element (74) disposed between a pair of reflective elements (70) (see figure 3 and 5, where the filler 74 is disposed between two adj. reflectors 70).

Regarding claim 2, Mliner teaches a reflective layer (70) coated to a face of the scintillator array (50).

Regarding claim 3, Mliner teaches light absorption element is configured to reduce optical cross-talk between the at least two adjacent scintillators (column 5 line 24).

Regarding claim 4, Mliner teaches the light absorption element is configured to substantially eliminate optical cross-talk between the at least two adjacent scintillators (column 5 line 24).

Regarding claim 5, Mliner teaches the light absorption element is further configured to absorb x-ray photons (column 5 line 24).

Regarding claim 7, Mliner teaches the light absorption element is further configured to reduce x-ray punch-through (column 5 line 24).

Regarding claim 8, Mliner teaches the light absorption element includes a high atomic number metal composite (column 5 line 24).

Regarding claim 9, Mliner teaches the metal composite includes a cured metal powder and low viscosity polymer combination (column 5 line 30).

Regarding claim 11, Mliner teaches the metal composite includes at least one of tungsten (column 5 line 29).

Regarding claim 13, Mliner teaches the detector incorporated into a CT imaging system (figure 1).

Regarding claim 14, Mliner teaches the CT imaging system is configured to acquire radiographic data of a medical patient (figure 1).

Regarding claim 15, Mliner teaches a CT system comprising:

a rotatable gantry having a bore centrally disposed therein (figure 1);

a table movable fore and aft through the bore and configured to position a subject for CT data acquisition (figure 1);

a high frequency electromagnetic energy projection source positioned within the rotatable gantry and configured to project high frequency electromagnetic energy toward the subject (figure 1); and

a detector array disposed within the rotatable gantry and frequency electromagnetic energy projected by the projection source and impinged by the subject, the detector array including (figure 1):

a scintillator array (60) configured to illuminate upon reception of radiographic energy;

a reflector assembly disposed between adjacent scintillators (50) of the scintillator array; and

wherein each reflector assembly includes a layer (74) sandwiched between at least a pair of reflective layers (70) (see figure 3 and 5, where the filler 74 is disposed between two adj. reflectors 70).

Regarding claim 16, Mliner teaches the composite layer (74) includes a high-z metal and a low-viscosity polymer (column 5 line 25+).

Regarding claim 17, Mliner teaches the high Z-metal includes one of tungsten (column 5 line 25+).

Regarding claim 18, Mliner teaches the low-viscosity polymer has a non-translucent color (column 5 line 24).

Regarding claim 21, Mliner teaches the reflector assembly is cast between adjacent scintillators (figure 4 and 5).

Regarding claim 22, Mliner teaches a method of CT detector manufacturing comprising the steps of:

providing a scintillator array (60) of a disposing a reflective layer (70) between adjacent scintillators (50) and

disposing a composite layer (74) in the reflective layer (70).

Regarding claim 23, Mliner teaches the step of providing a scintillator array includes the step of forming a substrate of scintillation material (figure 4).

Regarding claim 24, Mliner teaches a step of pixelating the substrate (figure 4).

Regarding claim 25, Mliner teaches the step of pixelating includes at least one of chemically forming gaps in the substitute to define a plurality of scintillators (column 4 line 20).

Regarding claim 26, Mliner teaches mechanically forking gaps includes dicing the substrate (column 4 line 20).

Regarding claim 27, Mliner teaches the step of depositing reflective material into a least the gaps (figure 4 and 5).

Regarding claim 28, Mliner teaches the step of depositing includes the step of casting (column 5 line 22).

Regarding claim 29, Mliner teaches the step of disposing a composite layer in the reflective layer includes the step of creating channels in the reflective material (the successive coating on the scintillator block will create reflective layer channel, figure 5).

Regarding claim 31, Mliner teaches the step of depositing composite material (74) into the channels (figure 3 and 5).

Regarding claim 32, Mliner teaches the composite material includes a metal and a polymer (column 5 line 25+).

Regarding claim 33, Mliner teaches the step of depositing composite material into the channels includes casting (column 5 line 22).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Karellas (US 5519227).

Regarding claim 1, Karellas teaches a CT detector comprising:

a scintillator array having a plurality of scintillators' (52) and

a reflector (54) interstitially disposed between at least two adjacent scintillators (52), the reflector including a light absorption element (58) disposed between a pair of reflective elements (54) (figure 2b).

Regarding claim 22, Karellas teaches a method of detector manufacturing comprising the steps of:

providing a scintillator array (52) of a disposing a reflective layer (54) between adjacent scintillators (52) and

disposing a composite layer (58) in the reflective layer (54).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6, 10, 12 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mliner.

Regarding claim 6, Mliner teaches the claimed invention except for the light absorption element is configured to absorb approximately 50% of the x-ray. It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure to absorb 50% of x-ray, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. Accordingly, one having ordinary skill in the

art would be motivated to adapt the claimed absorption since it would further improve the cross-talk between the scintillator pixels.

Regarding claim 10, Mliner teaches the claimed invention except for the polymer includes polyurethane.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to adapt the polyurethane, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

Regarding claims 12 and 19, Mliner fails to teach the pair of reflective elements include TiO_2.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to adapt the polyurethane, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Accordingly, one having ordinary skill in the would be motivated to adapt TiO_2 because it would improve the cross-talk between the scintillator pixels.

Regarding claim 20, Mliner fails to teach each reflective layer has a lateral thickness of approximately 15-90 μm and the composite layer has a lateral thickness of approximately 50-100 μm.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the claimed layer thickness, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the

optimum or workable ranges involves only routine skill in the art. Accordingly, one having ordinary skill in the would be motivated to adapt the layer thickness because it would improve the cross-talk between the scintillator pixels.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ackelsberg et al. (US 6285741) in view of Karellas.

Regarding claim 15, Ackelsberg teaches a CT system comprising:

a rotatable gantry having a bore centrally disposed therein (figure 1);

a table movable fore and aft through the bore and configured to position a subject for CT data acquisition (figure 1);

a high frequency electromagnetic energy projection source positioned within the rotatable gantry and configured to project high frequency electromagnetic energy toward the subject (figure 1); and

a detector array disposed within the rotatable gantry and frequency electromagnetic energy projected by the projection source and impinged by the subject, the detector array including (figure 1):

a scintillator array configured to illuminate upon reception of radiographic energy (figure 5).

However Ackelsberg fails to teach the detector comprising

a reflector assembly disposed between adjacent scintillators of the scintillator array; and wherein each reflector assembly includes a layer sandwiched between at least a pair of reflective layers.

Karellas teach a x-ray detector having a reflector assembly (54) disposed between adjacent scintillators (52) of the scintillator array; and wherein each reflector assembly includes a layer (58) sandwiched between at least a pair of reflective layers (figure 2b).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the CT detector of Ackelsberg with the reflector and the layer as taught by Karellas, since it would reduce cross-talk between the scintillators.

Allowable Subject Matter

Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 30, Mliner fails to teach the step of creating includes at least one of laser cutting, wire cutting and etching.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HKS

7/28/05
HKS

DAVID V. BRUCE
PRIMARY EXAMINER